

GCSE

Mathematics B (Linear)

Component **J567/01**: Mathematics Paper 1 (Foundation)

General Certificate of Secondary Education

Mark Scheme for November 2015

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

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1. Annotations used in the detailed Mark Scheme.

Annotation	Meaning
✓	Correct
✗	Incorrect
BOD	Benefit of doubt
FT	Follow through
ISW	Ignore subsequent working (after correct answer obtained), provided method has been completed
M0	Method mark awarded 0
M1	Method mark awarded 1
M2	Method mark awarded 2
A1	Accuracy mark awarded 1
B1	Independent mark awarded 1
B2	Independent mark awarded 2
MR	Misread
SC	Special case
^	Omission sign

These should be used whenever appropriate during your marking.

The **M**, **A**, **B** etc annotations must be used on your standardisation scripts for responses that are not awarded either 0 or full marks.

It is vital that you annotate these scripts to show how the marks have been awarded.

It is not mandatory to use annotations for any other marking, though you may wish to use them in some circumstances.

Subject-Specific Marking Instructions

2. **M** marks are for using a correct method and are not lost for purely numerical errors.
A marks are for an accurate answer and depend on preceding **M** (method) marks. Therefore **M0 A1** cannot be awarded.
B marks are independent of **M** (method) marks and are for a correct final answer, a partially correct answer, or a correct intermediate stage.
SC marks are for special cases that are worthy of some credit.
3. Unless the answer and marks columns of the mark scheme specify **M** and **A** marks etc, or the mark scheme is 'banded', then if the correct answer is clearly given and is not from wrong working **full marks** should be awarded.

Do not award the marks if the answer was obtained from an incorrect method, ie incorrect working is seen and the correct answer clearly follows from it.

4. Where follow through (**FT**) is indicated in the mark scheme, marks can be awarded where the candidate's work follows correctly from a previous answer whether or not it was correct.

Figures or expressions that are being followed through are sometimes encompassed by single quotation marks after the word *their* for clarity, eg FT $180 \times (\textit{their} '37' + 16)$, or FT $300 - \sqrt{(\textit{their} '5^2 + 7^2)}$. Answers to part questions which are being followed through are indicated by eg FT $3 \times \textit{their} (a)$.

For questions with FT available you must ensure that you refer back to the relevant previous answer. You may find it easier to mark these questions candidate by candidate rather than question by question.

5. Where dependent (**dep**) marks are indicated in the mark scheme, you must check that the candidate has met all the criteria specified for the mark to be awarded.
6. The following abbreviations are commonly found in GCSE Mathematics mark schemes.
- **cao** means **correct answer only**.
 - **figs 237**, for example, means any answer with only these digits. You should ignore leading or trailing zeros and any decimal point eg 237000, 2.37, 2.370, 0.00237 would be acceptable but 23070 or 2374 would not.
 - **isw** means **ignore subsequent working** (after correct answer obtained).
 - **nfw** means **not from wrong working**.
 - **oe** means **or equivalent**.
 - **rot** means **rounded or truncated**.
 - **seen** means that you should award the mark if that number/expression is seen anywhere in the answer space, including the answer line, even if it is not in the method leading to the final answer.
 - **soi** means **seen or implied**.
7. Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise, indicated for example by the instruction 'mark final answer'.
8. As a general principle, if two or more methods are offered, mark only the method that leads to the answer on the answer line. If two (or more) answers are offered, mark the poorer (poorest).
9. When the data of a question is consistently misread in such a way as not to alter the nature or difficulty of the question, please follow the candidate's work and allow follow through for **A** and **B** marks. Deduct 1 mark from any **A** or **B** marks earned and record this by using the **MR** annotation. **M** marks are not deducted for misreads.

10. Unless the question asks for an answer to a specific degree of accuracy, always mark at the greatest number of significant figures even if this is rounded or truncated on the answer line. For example, an answer in the mark scheme is 15.75, which is seen in the working. The candidate then rounds or truncates this to 15.8, 15 or 16 on the answer line. Allow full marks for the 15.75.
11. If the correct answer is seen in the body and the answer given in the answer space is a clear transcription error allow full marks unless the mark scheme says 'mark final answer' or 'cao'. Place the annotation ✓ next to the correct answer.

If the answer space is blank but the correct answer is seen in the body allow full marks. Place the annotation ✓ next to the correct answer.

If the correct answer is seen in the working but a completely different answer is seen in the answer space, then accuracy marks for the answer are lost. Method marks would still be awarded. Use the M0, M1, M2 annotations as appropriate and place the annotation ✗ next to the wrong answer.
12. Ranges of answers given in the mark scheme are always inclusive.
13. For methods not provided for in the mark scheme give as far as possible equivalent marks for equivalent work. If in doubt, consult your Team Leader.
14. Anything in the mark scheme which is in square brackets [...] is not required for the mark to be earned, but if present it must be correct.

MARK SCHEME

Question			Answer	Marks	Part marks and guidance	
1	(a)	(i)	3400	1		
		(ii)	1028	1		
		(iii)	31.4	1		
		(iv)	24.2	1		
		(v)	-3	1		
	(b)		336	2	M1 Complete valid method to find 40% or B1 for figs 336 e.g. 3360 as answer	Method must not be spoilt
2	(a)		10	1		
	(b)		bar of height 11 in correct position	2	M1 for 70- (10+18+15+16) soi	Bar need top and sides
	(c)		Snow Boarding	1FT	Must follow through from <i>their</i> bar chart	
	(d)		5	2	M1 15 and 10	
3	(a)		(1,3)	1		
	(b)		point plotted at (-4, -3)	1		
	(c)		Scalene cao	1		
4	(a)		[0].8	1		
	(b)		6	1		
5	(a)		163	1		Allow 161 - 165
	(b)		obtuse	1		
	(c)	(i)		105 line 180	1 1	
(ii)			42 opposite	1 1		
6	(a)		unlikely	1		
	(b)		certain	1		
7	(a)		-6	1		
	(b)		11	1		

Question			Answer	Marks	Part marks and guidance	
8			correctly completed table	2	B1 for 3 further correct rows	
9	(a)	(i)	25	1		
		(ii)	9	1		
	(b)		$8r - 3s$ final answer	2	B1 for $8r$ or $-3s$ in answer	$8r + - 3s$ scores B1
10	(a)	(i)	23	1		
		(ii)	[0]917	1		Any format for time [0]917, [0]9.17, [0]9:17, 9 17am not pm
	(b)	(i)	[0]941	1		Any format for time [0]941, [0]9.41, [0]9:41, 9 41am not pm
		(ii)	4 [hours] 40 [minutes]	2	B1 for either 4 [hours] or 40 [minutes]	
11	(a)		150	2	M1 for $240 \div 8$ soi by 30 or <i>their</i> 30×5	
	(b)		30	2	B1 for 48 or 18 Or M1 for $4 \times 12 - 6 \times 3$	Do not accept 48a 18b

Question		Answer	Marks	Part marks and guidance	
12	(a)	OCR travel by £124 nfw	5	<p>B4 for [£]124 as answer</p> <p>OR</p> <p>M4 for complete method leading to “<i>their</i>” 124 with correct decision for “<i>their</i>” 124</p> <p>OR</p> <p>M3 for complete method leading to “<i>their</i>” 1700 and “<i>their</i>” 1824.</p> <p>OR</p> <p>B3 for 1700 and 1824</p> <p>OR</p> <p>M2 for complete method leading to “<i>their</i>” 1700 or “<i>their</i>” 1824.</p> <p>OR</p> <p>B2 for 1700 or 1824. or 1800 and 1920 or 1620 <u>and</u> 1824 or 890 <u>and</u> 912</p> <p>OR</p> <p>M1 for 900×2, or 960×2, or method to find 10% of 900 or 5% of 960</p> <p>OR</p> <p>B1 for 1800 or 1920 or 810 or 912</p> <p>SC3 for answer of OCR by £22</p>	Cost of 1 person

Question		Answer	Marks	Part marks and guidance	
13	(a)	38	2	M1 for 14+14+ 10	
	(b)	48	3	M1 $\sqrt{36}$ soi by 6 and M1 for <i>their</i> $\sqrt{36} \times 8$	Allow second M1 for “their” width multiplied by 8. Can be implied by answer
14	(a)	Pie chart with sectors of 32°, 60° and 38° and correct labels	3	M2 for one correct sector correctly labelled or 3 correct angle values given soi M1 one correct unlabelled sector or 2 correct angle values given	$\pm 2^\circ$. Allow 2 sectors in range for 3 marks.
	(b)	45	1		

Question	Answer	Marks	Part marks and guidance
15*	<p>Fully correct conversion and addition of fractions with a common denominator and explanation that compares $\frac{13}{12}$ oe with 1 oe and sum of probabilities should add to 1oe.</p> <p>Or $13n$ is too many should be $12n$ with $1n$, $3n$, $4n$ and $5n$ used.</p> <p>Fully correct conversion and addition of fractions with a common denominator, and explanation that compares $\frac{13}{12}$ oe with 1 oe or sum of probabilities should add to 1oe.</p> <p>Or recognition of $1n$, $3n$, $4n$ and $5n$ counters add to more than $12n$</p> <p>Correct conversion of 2 of the fractions or $1n$, $3n$, $4n$ and $5n$ counters or converting 4 fractions to a correct decimal or percentage, recurring decimals must be correct to 3dp or better.</p> <p>Or $\frac{13}{12}$ obtained and a relevant comment</p> <p>No worthwhile work attempted</p>	<p>5</p> <p>4-3</p> <p>2-1</p> <p>0</p>	<p>Fully correct conversion and addition of all fractions with a common denominator, or $1n$, $3n$, $4n$ and $5n$ counters added to give $13n$</p> <p>Correct conversion of 1 of the fractions or a correct common denominator for all fractions. Or recognition that all must be out of $12n$. Or converting 2 fractions to a correct decimal or percentage, recurring decimals must be correct to 3dp or better. Or $12n$ counters. Or $\frac{13}{12}$</p>

Question			Answer	Marks	Part marks and guidance
16	(a)	(i)	Circumference	1	Check diagram in all parts
		(ii)	Tangent	1	
		(iii)	Segment	1	
	(b)		16π	2	M1 for $4 \times 4 \times \pi$ or $4^2 \times \pi$ or $4 \times 4 \times 3.14[2]$ Allow $16 \times \pi$
17	(a)		$20x + 50$	1	
	(b)		11.5 oe	3	M1 for $5x - 3x + a = b$ oe ie correctly combining x's M1 for $cx = 16 + 7 + dx$ oe ie correctly combining numbers M1 for $x = f/e$ after $ex = f$ to a maximum of 2 marks Must be equations
18	(a)		correct triangle at (3, -2), (5, 1) and (5, -2)	2	B1 for either the horizontal or vertical movement correct in correct orientation Ignore labels, condone freehand, mark intent
	(b)		correct triangle at (-3, -2), (-5, -5) and (-5, -2)	2	B1 for correct rotation about the wrong centre Ignore labels, condone freehand, mark intent
	(c)		rotation [about] (0, 0) [through] 90° [anticlockwise] oe	3	B1 for rotation or rotate[s] B1 for (0, 0) or O or origin B1 for 90° [anticlockwise] oe Not turn 0 scored if more than one transformation condone missing degree sign
19	(a)		[0]9 35	1	Any format for time [0]935, [0]9.35, [0]9:35, 9 35am not pm
	(b)		110	2	M1 for 55 (or 85) \div a time interval Or 55 (or 85) $\times 2$ Time eg 30 or 0.5
20	(a)		9 subtracted 6	1 1	May be indicated on sequence Need direction and quantity

Question		Answer	Marks	Part marks and guidance	
	(b)	$7n + 5$	2	B1 $7n$	
21		$\begin{array}{cc} 5 & 10 \\ 2 & 6 \end{array}$	4	B3 for 1 row correct OR M1 for $(26 - 11) \div 3$ AND M1 for $8 \div 4$ OR SC2 for correct rows transposed	Implied by 10 and 5 not on 2 nd row Implied by 6 and 2 not on 1st row
22		$\begin{array}{cc} 60 & 60000 \\ & \text{cm}^3 \end{array}$	2 1	M1 for $2 \times 5 \times 6$ or $20 \times 50 \times 60$ Must use mm^3 if their answer is greater than 1000 or their method is clearly using mm.	
23	(a)	(i)	1	accept any correct explanation	see the exemplars select best response or part
		(ii)	1	accept any correct explanation	see the exemplars select best response or part
	(b)		2	B1 for a suitable question and at least three boxes with one error or at least three correct boxes with no overlap or gaps, with no/incorrect question	
24		$t > 1$ or $t < 0$ eg 5, 7 any non square number $t > 1$	4	$0 \leq f \leq 1$ eg 5, 15 any square number $0 < f \leq 1$	B1 for each correct pair and accept any correct answer

APPENDIX

Exemplar responses for 23(a)(i)

Response	Mark
Too upfront – people would prefer to be in a margin not give their exact age	1
There is no option for people who don't want to give their age	1
Some might not feel comfortable answering	1
It is too direct	1
Should give them options	1
He will have count/ difficult to analyse them	1
It is rude	1
People prefer not to give their actual age	1
Too personal	1
They might lie	1
The question is not detailed enough	0
There is nothing wrong with this question	0
They won't get an average score with this question	0
Misleading people could put different ans such as 16.5	0
No units	0
Does not give time e.g.when	0

Exemplar responses for 23(a)(ii)

Response	Mark
The brackets overlap	1
The numbers are repetitive	1
Overlapping groups	1
20 and 40 don't know where to put it	1
0 year old can't write until 5-6 years	0
The age gaps are too wide	0
There is no box that states over 70	0
Too much gap between the ages, should be 20-25, 25-30	0
Broad question and answers	0
Not enough question boxes	0
Over 60 group is too large	0
What if they do not want to answer / too personal	0

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